Respiratory Protection

OSHA Standard 29 CFR 1910.134

The employer shall ensure that each employee can demonstrate knowledge of at least the following:

Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;

What the limitations and capabilities of the respirator are;

How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;

How to inspect, put on and remove, use, and check the seals of the respirator;

What the procedures are for maintenance and storage of the respirator;

How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators;

Training shall be conducted in a manner that is understandable to the employee:

The employer shall provide the training prior to requiring the employee to use a respirator in the workplace.

Retraining shall be administered annually and when the following situations occur:

Changes in the workplace or the type of respirator render previous training obsolete;

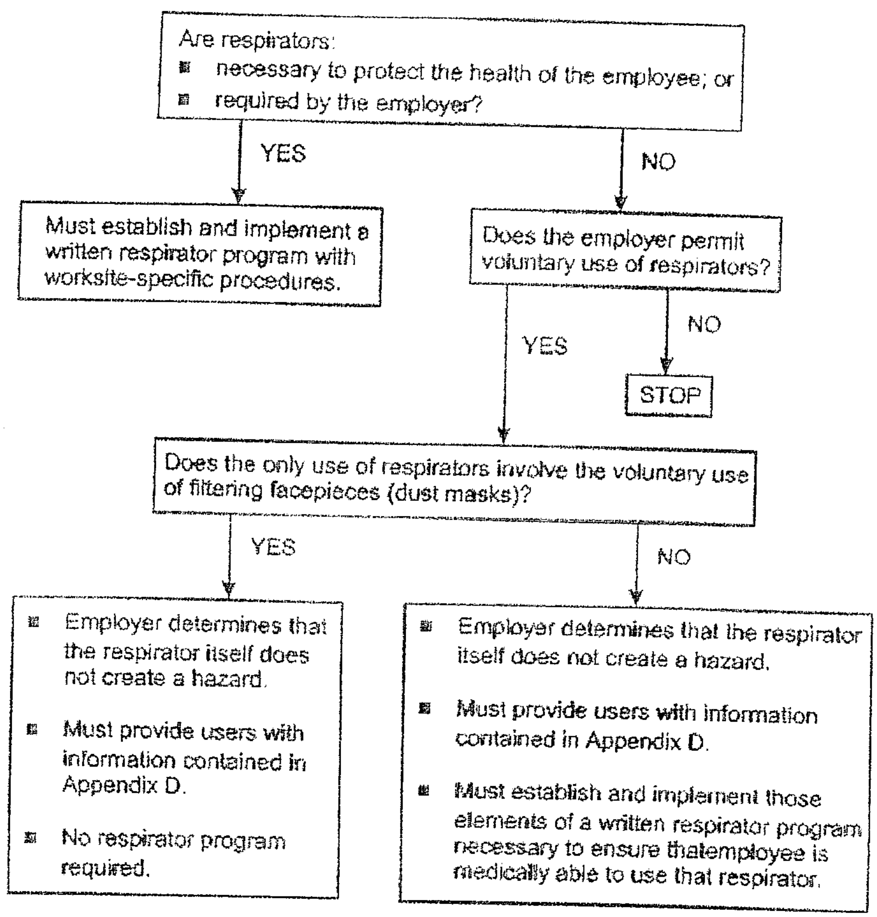
Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill; or

Any other situation arises in which retraining appears necessary to ensure safe respirator use.

Respiratory Protection Program

- Must designate a **qualified program administrator** to oversee the program
- Must provide respirators, training, and medical evaluations **at no cost to the employee**
- OSHA has prepared a *Small Entity Compliance Guide* that contains criteria for selection of a program administrator and a sample program.

Respirator-Use Requirements Flow Chart
29 CFR 1910.134(c)



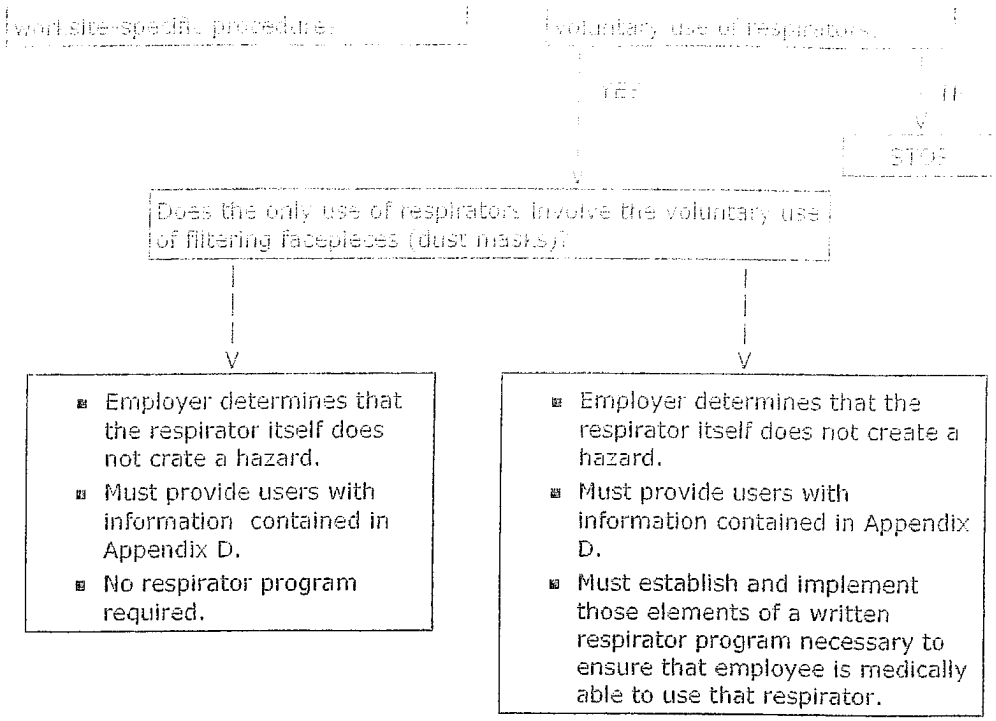
Text version of flowchart:

Respirator-Use Requirements Flow Chart
29 CFR 1910.134(c)

Are respirators:
- necessary to protect the health of the employees; or
- required by the employer?

YES → Must establish and implement a written respirator program with

NO → Does the employer permit



(d) Selection of Respirators

- Must select a respirator **certified by the National Institute for Occupational Safety and Health (NIOSH)** which must be used in compliance with the conditions of its certification.
- Must identify and evaluate the respiratory hazards in the workplace, including a reasonable estimate of employee exposures and identification of the contaminant's chemical state and physical form.
- Where exposure cannot be identified or reasonably estimated, the atmosphere shall be considered immediately dangerous to life or health (IDLH).
- Respirators for IDLH atmospheres:
  - Approved respirators:
    - full facepiece pressure demand self-contained breathing apparatus (SCBA) certified by NIOSH for a minimum service life of thirty minutes, or
    - combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.
  - All **oxygen-deficient atmospheres (less than 19.5% O2 by volume)** shall be considered IDLH.

    Exception: If the employer can demonstrate that, under all foreseeable conditions, oxygen levels in the work area can be maintained within the ranges specified in Table II (i.e., between 19.5% and a lower value that corresponds to an altitude-adjusted oxygen partial pressure equivalent to 16% oxygen at sea level), then any atmosphere-supplying respirator may be used.
- Respirators for non-IDLH atmospheres:
  - Employers must use the **assigned protection factors (APFs)** listed in Table 1 to select a respirator that meets or exceeds the required level of employee protection.
    - When using a combination respirator (e.g., airline respirators with an air-purifying filter), employers must ensure that the assigned protection factor is appropriate to the mode of operation in which the respirator is being used.
  - Must select a respirator for employee use that maintains the employee's exposure to the hazardous substance, when measured outside the respirator, at or below the **maximum use concentration (MUC)**.
    - Must not apply MUCs to conditions that are IDLH; instead must use respirators listed for IDLH conditions in paragraph (d)(2) of this standard.

- When the calculated MUC exceeds the IDLH level or the performance limits of the cartridge or canister, then employers must set the maximum MUC at that lower limit.
- The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

- For protection against gases and vapors, the employer shall provide:
  - an atmosphere-supplying respirator, or
  - an air-purifying respirator, provided that:
    - the respirator is equipped with an **end-of-service-life indicator (ESLI)** certified by NIOSH for the contaminant; or
    - if there is no ESLI appropriate for conditions of the employer's workplace, the employer implements a **change schedule** for canisters and cartridges that will ensure that they are changed before the end of their service life and describes in the respirator program the information and data relied upon and basis for the change schedule and reliance on the data.
- For protection against particulates, the employer shall provide:
  - an atmosphere-supplying respirator; or
  - an air-purifying respirator equipped with high efficiency particulate air (HEPA) filters certified by NIOSH under 30 CFR Part 11 or with filters certified for particulates under 42 CFR Part 84; or
  - an air-purifying respirator equipped with any filter certified for particulates by NIOSH for contaminants consisting primarily of particles with mass median aerodynamic diameters of at least 2 micrometers.

(e) Medical Evaluation

- Must provide a medical evaluation to determine employee's ability to use a respirator, **before fit testing and use.**
- Must identify a **physician or other licensed health care professional (PLHCP)** to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire (information required is contained in mandatory Appendix C).
- Must obtain a **written recommendation** regarding the employee's ability to use the respirator from the PLHCP.
- Additional medical evaluations are required under certain circumstances, e.g.:
  - employee reports medical signs or symptoms related to ability to use respirator;
  - PLHCP, program administrator, or supervisor recommends reevaluation;
  - information from the respirator program, including observations made during fit testing and program evaluation, indicates a need; or
  - change occurs in workplace conditions that may substantially increase the physiological burden on an employee.
- Annual review of medical status is not required.

(f) Fit Testing

- All employees using a **negative or positive pressure tight-fitting facepiece** respirator must pass an appropriate **qualitative fit test (QLFT)** or **quantitative fit test (QNFT).**
- Fit testing is required prior to initial use, whenever a different respirator facepiece is used, and **at least annually thereafter.** An additional fit test is required whenever the employee reports, or the employer or PLHCP makes visual observations of, changes in the employee's physical condition that could affect respirator fit (e.g., facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight).
- The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol, as contained in mandatory Appendix A.
  - QLFT Protocols:
    - Isoamyl acetate
    - Saccharin
    - Bitrex
    - Irritant smoke
  - QNFT Protocols:
    - Generated Aerosol (corn oil, salt, DEHP)

- Condensation Nuclei Counter (PortaCount)
- Controlled Negative Pressure (Dynatech FitTester 3000)
- Controlled Negative Pressure (CNP) REDON

- QLFT may only be used to fit test negative pressure air-purifying respirators (APRs) that must achieve a fit factor of 100 or less.

- If the fit factor determined through QNFT is ≥100 for tight-fitting half facepieces, or ≥500 for tight-fitting full facepieces, the QNFT has been passed with that respirator.

> *Note:* If a particular OSHA standard (e.g., 29 CFR 1910.1001 Asbestos) requires the use of a full facepiece APR capable of providing protection in concentrations up to 50 times the Permissible Exposure Limit (PEL), this respirator must be QNFT. This is because a protection factor of 50 (50 X PEL) multiplied by a standard safety factor of 10 is equivalent to a fit factor of 500.
>
> The safety factor of 10 is used because protection factors in the workplace tend to be much lower than the fit factors achieved during fit testing. The use of a safety factor is a standard practice supported by most experts to offset this limitation. This is discussed in the record at 63 FR 1225.

(g) Use of Respirators

- Tight-fitting respirators shall not be worn by employees who have facial hair or any condition that interferes with the face-to-facepiece seal or valve function.

- Personal protective equipment shall be worn in such a manner that does not interfere with the seal of the facepiece to the face of the user.

- Employees shall perform a user seal check **each time they put on a tight-fitting respirator** using the procedures in mandatory Appendix B-1 or equally effective manufacturer's procedures.

- Procedures for respirator use in IDLH atmospheres are stated. In addition to these requirements, interior structural firefighting requires the use of SCBAs and a protective practice known as "2-in/2-out" — at least two employees must enter and remain in visual or voice contact with one another at all times, and at least two employees must be located outside. (Note that this is not meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.)

(h) Maintenance and Care of Respirators

Must clean and disinfect respirators using the procedures in Appendix B-2, or equally effective manufacturer's procedures at the following intervals:

- as often as necessary to maintain a sanitary condition for exclusive use respirators,

- before being worn by different individuals when issued to more than one employee, and

- after each use for emergency use respirators **and those used in fit testing and training**.

(i) Breathing Air Quality and Use

Compressed breathing air shall meet the requirements for Type 1-Grade D breathing air as described in ANSI/CGA *Commodity Specification for Air*, G-7.1-1989.

(j) Identification of Filters, Cartridges, and Canisters

- All filters, cartridges, and canisters used in the workplace must be labeled and color coded with the NIOSH approval label.

- The label must not be removed and must remain legible.

(k) Training and Information

- Must provide effective training to respirator users, including:
  - why the respirator is necessary and how improper fit, use, or maintenance can compromise the protective effect of the respirator
  - limitations and capabilities of the respirator
  - use in emergency situations
  - how to inspect, put on and remove, use and check the seals
  - procedures for maintenance and storage
  - recognition of medical signs and symptoms that may limit or prevent effective use
  - general requirements of this standard
- Training required prior to initial use, unless acceptable training has been provided by another employer within the past 12 months.
- **Retraining required annually** and when:
  - workplace conditions change,
  - new types of respirator are used, or
  - inadequacies in the employee's knowledge or use indicates need.
- The basic advisory information in Appendix D shall be provided to employees who wear respirators when their use is not required.

(l) Program Evaluation

Employer must conduct evaluations of the workplace as necessary to ensure proper implementation of the program and consult with employees to ensure proper use.

(m) Recordkeeping

- Records of medical evaluations must be retained and made available per 29 CFR 1910.1020.
- A record of fit tests must be established and retained until the next fit test.
- A written copy of the current program must be retained.

Respirator Safety

Safety Training Handout

Why are Respirators Necessary?

Working without proper protection in an area with hazardous air particles can cause cancer, lung disease, problems with the liver, kidneys, heart and nervous system, and death.

Air Purifying Respirators:

- Remove harmful substance from the air so you can breathe safely.
- Have tight-fitting facepieces to stop you from breathing contaminated air.
- Are lightweight and allow you to easily move around the facility.
- Won't protect you if the cartridge or canister gets saturated with contaminants.
- Don't provide oxygen and won't protect you in environments immediately dangerous to your life or health.

Supplied Air Respirators:

- Provide breathing that is independent from the environment.
- Allow you to work in an environment with hazardous particles for as long as the facepiece is supplied with safe air.
- Range from Self Contained Breathing Apparatus to Air-Line Supplied Respirators to protective suits that totally encapsulate your body.
- Can be used for any type of contaminant or level of exposure.
- Restrict your movement and have hoses that can bump into machinery.

Don't Use a Respirator Until:

- A health care professional has declared you capable.
- Quantitative or qualitative fit testing has occurred.
- Positive or negative fit checks have taken place.

Leave the Respirator Area if You:

- Detect an odor or taste.
- Feel your eyes or throat becoming irritated.
- Observe a change in you breathing.
- Notice the facepiece is leaking or other parts of the respirator are broken.
- Hear an alarm signaling equipment failure.

Respiratory Safety

Safety Training *Handout*

Respirators are designed to protect workers in an environment that has hazardous air particles. When working with respirators it is critical to have them fitted and working properly to reduce the risk of cancer, lung disease, problems with the liver, kidneys, heart, and nervous system and even death. Not using or improperly using a respirator just once can lead to serious injuries, medical problems or even death.

■ OSHA recently finalized the Respiratory Protection Standard

- Assigned Protection Factors (APFs) have been added to the standard
- APFs are numeric values that tell you how much protection a respirator is expected to provide

■ Why and when to use a respirator

- Respirators protect workers from injury, health problems and even death attributed to inhaling hazardous air
- Always use a respirator when entering an area with hazardous air particles
- Even if you can't see or smell anything in the air, a respirator may still be needed

■ Different types of respirators

- Air purifying respirators (APRs)
- Supplied Air Respirators (SARs), and
- Self- contained breathing apparatus (SCBA)

■ Not everyone can safely use a respirator

- Get medical clearance before using a respirator, and
- Some medical conditions make it unsafe to use respirators

■ Proper fit, maintenance and storage of respirators

- Fit tests
- Respirator maintenance
- Storing respirators properly

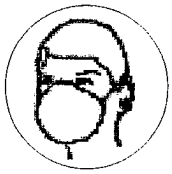
■ Immediately leave the area if

- Something smells or tastes out of the ordinary
- You experience burning or irritation of the eyes or throat
- Your breathing pattern changes, or
- The respirator facepiece leaks or other parts aren't working

OSHA QUICK CARD™

Protect Yourself
Respirators

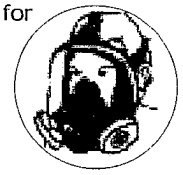
Respiratory protection must be worn whenever you are working in a hazardous atmosphere. The appropriate respirator will depend on the contaminant(s) to which you are exposed and the protection factor (PF) required. Required respirators must be NIOSH-approved and medical evaluation and training must be provided before use.



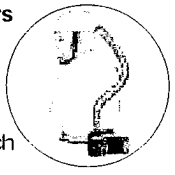
Single-strap dust masks are usually not NIOSH-approved. They must not be used to protect from hazardous atmospheres. However, they may be useful in providing comfort from pollen or other allergens.

Approved filtering facepieces (dust masks) can be used for dust, mists, welding fumes, etc. They do not provide protection from gases or vapors. DO NOT USE FOR ASBESTOS OR LEAD; instead, select from the respirators below.

Half-face respirators can be used for protection against most vapors, acid gases, dust or welding fumes. Cartridges/filters must match contaminant(s) and be changed periodically.



Full-face respirators are more protective than half-face respirators. They can also be used for protection against most vapors, acid gases, dust or welding fumes. The face-shield protects face and eyes from irritants and contaminants. Cartridges/filters must match contaminant(s) and be changed periodically.



Loose-fitting powered-air-purifying respirators (PAPR) offer breathing comfort from a battery-powered fan which pulls air through filters and circulates air throughout helmet/hood. They can be worn by most workers who have beards. Cartridges/filters must match contaminant(s) and be changed periodically.

A Self-Contained Breathing Apparatus (SCBA) is used for entry and escape from atmospheres that are considered immediately dangerous to life and health (IDLH) or oxygen deficient. They use their own air tank.

For more complete information:

OSHA Occupational Safety and Health Administration
U.S. Department of Labor
www.osha.gov (800) 321-OSHA

OSHA 3280-10N-05